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10/715,733	11/17/2003	Victor L. Klimov	S-102,311	4376

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LOS ALAMOS NATIONAL SECURITY, LLC
LOS ALAMOS NATIONAL LABORATORY
PPO. BOX 1663, LC/IP, MS A187
LOS ALAMOS, NM 87545

EXAMINER	
KUGEL, TIMOTHY J	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/715,733
Filing Date: November 17, 2003
Appellant(s): KLIMOV ET AL.

Samuel L. Borkowsky
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 18 January 2008 appealing from the Office action mailed 16 March 2007.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

US 2002/0110180	BARNEY et al.	08-2002
US 2002/0155507	BRUCHEZ et al.	10-2002

(9) Grounds of Rejection

The following grounds of rejection are applicable to the appealed claims:

Claims 1, 2, 4-9, 17, 18, 20-23 and 25 stand rejected under 35 USC 102(b) as being anticipated by US Patent Application Publication 2002/0110180 (Barney hereinafter).

Barney teaches colloidal nanocrystals, a solid composite including nanocrystals and a process of making a solid composite including nanocrystals comprising mixing nanocrystals—including ZnS, ZnSe, ZnTe, CdS, CdSe, CdTe, HgS, HgSe, HgTe, AlN, AlP, AlAs, AlSb, GaN, GaP, GaAs, GaSb, InN, InP, InAs, InSb, TlN, TlP, TlAs, TlSb, PbS, PbSe and PbTe nanocrystals (¶¶0011 and 0022)—with a amphiphilic material—including alkyl phosphines, alkyl phosphine oxides, alkyl phosphonic acids, or alkyl phosphinic acids such as tri-n-octyl phosphine and tri-n-octyl phosphine oxide (¶0022) or poly(lauryl methacrylate) (¶0015)—and a sol-gel precursor—such as silicon alkoxide, titanium alkoxide or zirconium alkoxide (¶0031)—and forming a solid matrix containing the nanocrystals (¶0031) at ratios of 5:1 to 10:1 of the nanocrystal solution to the binder (¶0042) such that the resulting composition has upwards of 80% high emission quantum efficiency (¶0018).

Claims 11, 12, 26 and 27 stand rejected under 35 USC 102(b) as anticipated by or, in the alternative, under 35 USC 103(a) as obvious over Barney.

Barney teaches colloidal nanocrystals, a solid composite including nanocrystals and a process of making a solid composite including nanocrystals comprising mixing nanocrystals—including ZnS, ZnSe, ZnTe, CdS, CdSe, CdTe, HgS, HgSe, HgTe, AlN, AlP, AlAs, AlSb, GaN, GaP, GaAs, GaSb, InN, InP, InAs, InSb, TlN, TlP, TlAs, TlSb, PbS, PbSe and PbTe nanocrystals—with a amphiphilic material—including alkyl phosphines, alkyl phosphine oxides, alkyl phosphonic acids, or alkyl phosphinic acids such as tri-n-octyl phosphine and tri-n-octyl phosphine oxide or poly(lauryl methacrylate)—and a sol-gel precursor—such as silicon alkoxide, titanium alkoxide or zirconium alkoxide—and forming a solid matrix containing the nanocrystals at ratios of 5:1 to 10:1 of the nanocrystal solution to the binder such that the resulting composition has upwards of 80% high emission quantum efficiency as detailed above.

Since Barney teaches the same composition as claimed, the transparency of the sol-gel host and the uniformity of the distribution of the nanocrystals of the Barney composition would inherently be the same as claimed.

Where applicant claims a composition in terms of a function, property or characteristic and the composition of the prior art is the same as that of the claim but the function is not explicitly disclosed by the reference, the examiner may make a rejection under both 35 USC 102 and 103. "There is nothing inconsistent in concurrent

rejections for obviousness under 35 USC 103 and for anticipation under 35 USC 102." See *In re Best*, 562 F2d 1252, 1255 n4, 195 USPQ 430, 433 n4 (CCPA 1977).

Claims 3, 10, 19 and 24 stand, rejected under 35 USC § 103(a) as being unpatentable over Barney as applied to claims 1, 2, 4-9, 11, 12 and 17-27 above in view of US Patent Application Publication 2002/0155507 (Bruchez hereinafter).

Barney teaches colloidal nanocrystals, a solid composite including nanocrystals and a process of making a solid composite including nanocrystals comprising mixing nanocrystals—including ZnS, ZnSe, ZnTe, CdS, CdSe, CdTe, HgS, HgSe, HgTe, AlN, AlP, AlAs, AlSb, GaN, GaP, GaAs, GaSb, InN, InP, InAs, InSb, TlN, TlP, TlAs, TlSb, PbS, PbSe and PbTe nanocrystals—with a amphiphilic material—including alkyl phosphines, alkyl phosphine oxides, alkyl phosphonic acids, or alkyl phosphinic acids such as tri-n-octyl phosphine and tri-n-octyl phosphine oxide or poly(lauryl methacrylate)—and a sol-gel precursor—such as silicon alkoxide, titanium alkoxide or zirconium alkoxide—and forming a solid matrix containing the nanocrystals such that the resulting composition has upwards of 80% high emission quantum efficiency as detailed above.

Barney does not disclose expressly the use of octylamine-modified poly(acrylic acid) as an amphiphilic polymer.

Bruchez discloses semi-conductor nanocrystals produced with partially grafted poly(acrylic acid) in which octylamines were attached to about 40% of the carboxyl groups of the poly(acrylic acid) (¶0287).

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use the octylamine-modified poly(acrylic acid) polymer of Bruchez in the compositions and processes of Barney. The motivation to do so would have been to produce a water-soluble semi-conductor nanocrystal composition that may be coated on a substrate (Bruchez ¶0287).

(10) Response to Argument

Appellant argues that Barney fails to teach amphiphilic polymers having hydrophilic and hydrophobic groups; however, Barney teaches the use of poly(laurel methacrylate) which meets the limitation of modified poly(methacrylic acid) and which applicant shows in their brief as having a structure comprising long-chain lauryl hydrocarbon groups—which would be hydrophobic—and ester groups—which would be hydrophilic.

Applicant further argues that Barney fails to teach admixing the nanocrystals with the polymer or the nanocrystal-polymer complex with the sol-gel precursor; however, Barney's teaching of the solid composite of the nanocrystal-polymer complex and the sol-gel precursor at least implicitly teaches that the components were admixed.

Applicant further argues that Example 2 of the instant specification shows unexpected results in regard to the PbSe nanocrystal composite of instant claims 6 and 22; however, first, claims 6 and 22 are rejected under 35 USC 102(b) as being

anticipated by Barney and therefore an argument of unexpected results is not germane. Further, even if relevant, Example 2, fails to show a nexus between the merits of the claimed invention and the evidence of secondary considerations in that claims 6 and 22 do not require the 40% octylamine modified poly(acrylic acid) of Example 2 and claims 10 and 24—which do require the octylamine modified poly(acrylic acid)—do not require the PbSe nanocrystal of Example 2. Still further, no comparison is made between the results of Example 2 and Barney, the closest prior art.

Applicant finally argues that there is no motivation to combine the teachings of Barney and Bruchez; however, *KSR* forecloses the argument that a specific teaching, suggestion or motivation is required to support a finding of obviousness. See *Ex parte Smith*--USPQ2d—slip op at 20 (Bd Pat App & Interf June 25, 2007) citing *KSR*, 82 USPQ2d at 1396. And further, ample rationale to combine the references is given by the teaching of Bruchez that the use octylamine grafted poly(acrylic acid) results in a water-soluble semiconductor that may be coated on a substrate (Bruchez ¶0287).

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/Timothy J. Kugel/
Patent Examiner, AU 1796

Conferees:

/Randy Gulakowski/

Supervisory Patent Examiner, Art Unit 1796

/James J. Seidleck/

Supervisory Patent Examiner, Art Unit 1796